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Addendum

Contributions by children and youth**

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I. Introduction

1. A fundamental prerequisite for the achievement of sustainable development is broad public participation in decision-making[1] and civil society plays an important role in these processes. Children and youth are widely recognized as an important aspect of civil society with respect to their role as the future protectors and preservers of the planet's resources. The past decade has seen a growing acceptance of the importance of youth participation in decision-making, and successful efforts to engage youth in that process has led to improved policy formulation, adoption, implementation and evaluation.[2] As Agenda 21 states in chapter 25, "it is imperative that youth from all parts of the world participate actively in all relevant levels of decision-making processes ... in addition to their intellectual contribution and their ability to mobilize support, they bring unique perspectives that need to be taken into account".

2. The eighteenth session of the Commission on Sustainable Development brings five thematic discussion topics to the tables of sustainable development: mining, transport, waste, chemicals and the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns. While these topics are largely technical, the Major Group on Children and Youth seeks to consider the social and economical implications of each.

3. The present paper will discuss each of the five thematic areas, providing an overview of the topics and the different youth initiatives and activities that have occurred. A significant portion of the paper will focus on issues pertaining to developing nations; these countries face the greatest challenges in sustainable development and particular attention needs to be paid in this regard.

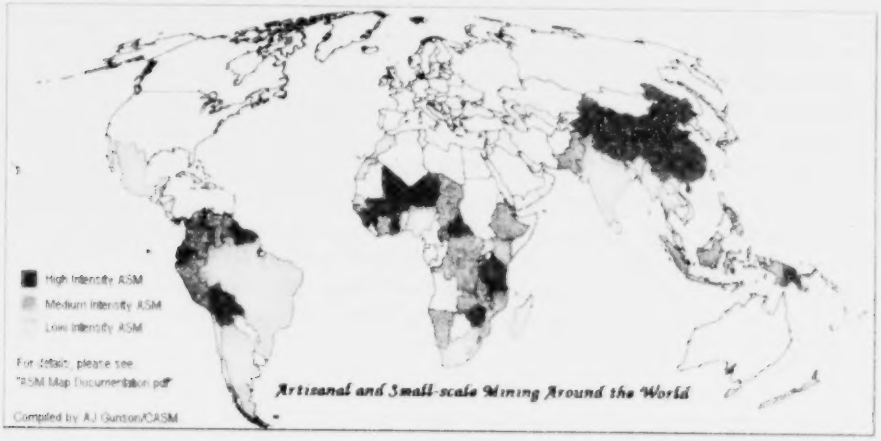
II. Mining

4. Artisanal and small-scale minings act as a major livelihood in various regions of the world, including Africa, Asia-Pacific, and Central and South America (see figure I) and plays a significant role in contributing to economic advancement within developing nations. Mining is important to consider in sustainable development and certain obstacles exist that prevent sustainability objectives from being achieved.

[1] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992*, vol. I, *Resolutions adopted by the Conference* (United Nations publication Sales No. E.93.I.8 and corrigendum), resolution I, annex II, Agenda 21, chap. 23.

[2] *World Youth Report 2005*, United Nations publication, No. E.05.IV.6, chap. 4.

Figure I
Artisanal and small-scale mining around the world


High Intensity ASM
Medium Intensity ASM
Low Intensity ASM
For details, please see "ASM Map Documentation.pdf"
Compiled by AJ Gunson/CASM
Artisanal and Small-scale Mining Around the World

Abbreviations: ASM, artisanal and small-scale mining; CASM, Communities, Artisanal and Small-Scale Mining initiative.

5. Small-scale mining has been an important industry in Africa, with operations controlled by the inhabitants of rural areas who use the environment to provide people with income and wealth.[3] Various methods of extracting minerals are used in this industry and as a direct result of these, a series of environmental impacts are experienced.[4] Land is converted from agriculture to a mine site and with the environmentally unsustainable practices used — including the absence of a rehabilitation plan — both agricultural and mining resources are lost.

6. The method of production for small-scale diamond mining ranges from basic methods of digging, washing and sifting to the use of equipment such as water pumps and excavators. The most common method is the highly labour-intensive process where large groups of people dig the earth, washing and sifting ore for diamonds. The environmental impact of small-scale diamond mining is severe as areas become exposed and unsuitable for farming. Miners remove vegetation and economically valuable trees and their activities cause increased erosion. The trees — which once acted as a secondary source of income — are removed to suit the conditions of a mining site. Mining carried out on hilly areas can lead to flooding,[5] which threatens the already limited infrastructure.

7. There is a strong legacy of environmental degradation linked to artisanal mining, largely caused by a lack of regulation and the rudimentary methods that are used. Soils are often contaminated, becoming highly acidic owing to excess erosion and leaching, exacerbated further by exposure during the mining process. Local

[3] G. Hilson, "Small scale mining in Africa: tackling pressing environmental problems with improved strategy", *The Journal of Environment and Development*, vol. 11, No. 2 (2002).

[4] United Nations Development Programme, *State of the environment report for Liberia* (UNDP, Monrovia, Liberia, 2006).

[5] B. Hofstatter, *Liberia: Trade, Environment and Conflict*, ICE Case Number 82, Liberia Diamonds (2001).

water quality is disturbed owing to siltation and the polluting discharge from machinery.[6]

8. The lack of health and safety measures also has an effect on the environment. The World Bank performed a case study of an artisanal mine in the West African region, observing the use of pit-latrines, bushes and streams for human defecation. The "boom towns" that appear around mining sites do not have proper infrastructure to support labouring miners and their families. Often sanitation and waste disposal are inefficiently managed, seeping into streams and contaminating drinking water.

9. These issues are exacerbated by the fact that very few artisanal miners attempt rehabilitation of their mining sites. The most common form of rehabilitation is to cover soil in layers of sand to refill excavated sites, but this significantly reduces the chance for the regrowth of vegetation. The obvious degradation of the landscape, and in some cases coastal areas, poses a threat to maintaining environmental integrity.

10. Environmental issues are compounded by a distinct lack of access to appropriate technology and poor skills development within the industry. Significant challenges are faced in terms of environmental awareness and the systematic knowledge and understanding of social and human realities of the places where the mining sector operates. There is a distinct lack of management capabilities, particularly within small-scale mining, and there is poor control and management of natural resources.

11. In areas such as the Oceania region, new mining techniques have been introduced to abate the environmental impact of mines, including sculpting settlement basins and terraces to lessen the sedimentation of waterways and coastal areas. Road building into mine sites is limited to a minimum and new legislation demands that the surrounding vegetation must be maintained as an organic buffer zone around mines and roads. The need to revegetate mine sites is swiftly becoming a priority.

12. While mining-related environmental issues are generally dealt with in country constitutions, in developing areas such as West Africa, there is no specific mining legislation within environmental legislative agencies.[7] Although legislative procedures exist, there is no fixed enforcement of such regulations and thus environmental considerations are largely ignored.

13. Even in areas where the dangers of mining on the local populace are well understood, the lack of alternative sources of income prove it difficult to make other choices. Families across Asia and the Pacific are often forced to send their children to work in the mines; in Kyrgyzstan, the collapsed entrances of officially abandoned Soviet-era coal mines admit only the small bodies of children. Children become breadwinners for their families, depriving them of access to education — even if schools are relatively available (see http://news.bbc.co.uk/2/hi/6955202.stm).

14. The socio-economic implications of mining are extensive and range across a number of social issues, including health, livelihood sustainability, education, rights

[6] World Bank, West Africa Regional Mining Forum: Opportunities and Challenges, February 2008, available from http://siteresources.worldbank.org (accessed 8 September 2008).

[7] West Africa Mineral Sector Strategic Investment, "Pilot SEA Program at the World Bank, PEP Meeting, Washington, D.C." (unpublished report, 2008).

issues and family structures. Artisanal and small-scale mining is an expanding and disorganized sector, where most diggers live below the poverty line, and include a significant number of vulnerable groups (up to 80 per cent), such as migrant workers, women, and children and youth.

15. Mining activities expose communities to a wide range of health problems. Heavy rains cause dug-out areas to become stagnant pools that turn into breeding grounds for mosquitoes, increasing the incidence of malaria. People in contact with water sources contaminated by mine wastes are exposed to disease, exacerbated by relatively limited access to medical facilities. Mining activities cause heavy silt to flow into river beds and creeks, reducing fish populations and placing strains on household food security. Toxic wastes in water sources contaminate marine life, making them unfit for human consumption. The mines themselves are often not safe, with numerous casualties occurring as a result of unsafe practices. Chemicals are often used unsafely to extract minerals from rock, and mercury is a common element handled by those in the gold industry. The establishment of a mine often requires the removal of people and villages in the area. This affects local economies and cultural identities as men leave their communities to become (seasonal) miners, leaving behind villages inhabited only by women, children and the elderly. Children often have to abandon notions of education as they are forced into the employment sector for the sake of survival. Miners are also a high-risk group for HIV/AIDS and other sexually transmitted diseases, and when miners return to their villages, these diseases are spread further.

16. The small-scale mining industry employs an estimated 13 million workers worldwide. While there is no indication of child labour in the formal sector, the low output, non-mechanized, highly labour-intensive artisanal operations present a different scenario. The exact number is difficult to determine owing to the remoteness, informal character and mobility of the industry, but it is estimated that approximately 1 million children worldwide are involved in such activities. Research carried out by the International Labour Organization (ILO) International Programme on the Elimination of Child Labour (IPEC) produced evidence that girls as well as boys are involved in hazardous work in the small-scale mining industry. This work is considered highly dangerous to children. Physically, it requires working with heavy and awkward loads, involves strenuous work with heavy tools and equipment, exposure to toxic and explosive chemicals, and extremes of heat and cold.[8] Psychologically, mining activities can be detrimental to children considering they are usually in remote areas where law, social and family structures are often non-existent and circumstance perpetuates alcoholism, drug use and prostitution.

17. While mining has had a negative effect on a number of socio-economic and environmental issues, the sector has also contributed extensively to infrastructural and economic development. Better road, communication and energy infrastructure is commonly associated with mines, providing increased employment opportunities, water infrastructure and urban development. While these have positively contributed to societies, community expectations are also raised during this process and are a main source of discontent among populations.

[8] International Labour Organization, "Girls in mining, research findings from Ghana, Niger, Peru, and United Republic of Tanzania" (2007).

18. Policymakers in the environmental field have begun to recognize the importance of incorporating analytically rigorous foundations into their decision-making. However, while policymakers are calling for increased intellectual rigour in environmental planning, large gaps in data and a lack of time-series data still hamper efforts to track many environmental issues, spot emerging problems, assess policy options and gauge effectiveness. There is a need to build human and institutional capacities within the mining sector, recognizing that donor assistance programmes are not sustainable. Education needs to become a priority within this sector, which will not only increase awareness of environmental and social issues, but also serve as a catalyst for increased livelihood sustainability and poverty alleviation.

19. Efforts by Governments and civil society alike have shown that other economic activities within mining communities need to be developed, should the alleviation of child-labour in mines be truly attained. While the moral imperative is relatively easy to advocate, there must be realistic means for communities to bolster their domestic incomes while allowing their children to attend schools. The role of youth should be considered in this regard as youth could serve as powerful catalysts for change and aid in empowering communities to achieve sustainability. As evidenced by the work of ILO from Mongolia to Indonesia, the creation and/or involvement of local development agencies could constitute a way of strengthening institutional frameworks and their role in this process should not be overlooked.

III. Transport

20. In an increasingly interconnected world, the mobility of commodities and people has become an indispensable feature of everyday life. In developing countries and those with transitional economies, the transport sector plays a vital role in economic growth.

21. The amount of processed natural resources required to power motorized vehicles is soaring annually. The amount of energy required to retrieve this fuel from the earth, to process it and to deliver it is increasing correspondingly. Energy is also required to build land-, sea- and air-transport vehicles, and to dispose of their carcasses at the end of their working life. Building transport infrastructure is also energy-intensive and results in the loss of land and biodiversity. The sustainability of this rapacious level of energy consumption in transport is a matter of doubt, and there is anxiety about the consequences for competing energy uses in farming, water pumping, lighting, heating, cooling and cooking, among others.

22. There have been positive examples of reducing the negative effects of transport by using alternatives to contemporary modes of transportation. Globally, over 500 organizations are promoting alternatives to lifestyles built around the car (see also www.worldcarfree.net).

23. The unfairness of the geographically and socially distorted consumption of transport energy is a major political and moral issue. The negative effects of transport can be found in Africa, where the burden of costly, energy-demanding commuter transport is disproportionately borne by those living in poverty, hindered by the separation of their places of work and living. The time and money that the poor spend meeting their basic mobility needs represent a significant constraint on the ability of low-income families to accumulate the assets allowing them to lift

themselves out of poverty. Transport services and transport-related construction also are frequently critical sources of employment for the urban poor. Goods and services are sometimes more expensive in low-income communities owing to poor transport infrastructure and services.

24. Transportation infrastructure facilities in African countries are inadequate to cope with economic growth, contributing to traffic congestion in cities and increased road accidents. A leading cause of death among the world's youth is land transport accidents.[9] Likewise, the level of respiratory health problems is increased owing to gas emissions.

25. Transport-related issues such as access to jobs, markets and social/educational facilities play an important role in perpetuating the disadvantaged position of women, in particular that of young girls, in society. While there have been efforts to incorporate gender perspectives, especially into the health, education and agricultural sectors, fewer attempts have been made in the transport sector, despite the vital role transport plays in most young women's daily routines. Existing transport systems are not adequately geared towards the needs of women. Rather, most systems are biased towards the travel needs of male breadwinners. In order to alleviate women's disproportionate transport burden in society, a variety of factors need to be addressed, including access to modes of transport, the routing of facilities and infrastructures, and the timing and frequency of services.

26. The role of transport in the collapse of local economies is being understood, and reverting to a greater degree of community self-sufficiency in food production, among other things, appeals because it is environmentally sustainable and has positive social consequences for building cooperation. Transport joins but also separates. The role of transport in the depletion of energy stocks is one of two ways in which it is linked with environmental sustainability. The other is via its impact on the environment by way of exhaust emissions from vehicles, and accidental fuel and oil spills or deliberate washing of storage tanks. Transport accounts for approximately 20 per cent of global emissions, but users are shielded from noticing its unpleasant side effects. Occasional environmental catastrophes caused by oil tanker accidents make headline news, but the cumulative effect of day-to-day pollution from 700 million road motor vehicles goes largely unnoticed. Policies outlawing lead in petrol motor fuel bring motorists into line with world standards, but are no bold step towards reducing private car use.

27. The incalculable historic damage done to the environment by the transport sector can never be recovered. During two especially devastating centuries when transport engineering cleared and levelled tracks and spaces, habitat has disappeared, drainage has been altered and wetlands have been compromised. The same transport that enabled suburbanization destroyed the countryside forever, including the green "lungs" that people began to consider only after industrialization and motorization had begun to take their toll.

28. The public health bill of transport might be approximated in terms of hospitalization rates and insurance payouts, but the long-term damage to the environment is inestimable. Environmental spoilation has been made temporary rather than permanent by replanting, restocking, and the diversion of river channels.

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[9] *World Youth Report 2007*, United Nations publication, Sales No. E.07.IV.1, statistical annex, annex 12.

29. In terms of the impact of transport on climate change, according to the Intergovernmental Panel on Climate Change, the transport sector is responsible for 23 per cent of the world's energy-related carbon dioxide (CO_2) emissions and has the highest growth rate among the end-user sectors. The recent phenomenal growth in the use of energy and transport has led to more pollution, resource depletion, congestion and an increase in greenhouse gas emissions, which all contribute to climate change. Importantly, the transport sector is almost solely dependent on petroleum as its energy source, and with the problematic global outlook for traditional oil supplies, attention needs to be shifted towards reducing the sector's reliance on such unsustainable dependence. International initiatives are investigating and promoting a more stable domestic energy balance for fuel types, with biodiesel and bioethanol becoming regular petroleum additives. In parts of North America, there are governmental incentives for the use of hybrid vehicles and for the development of clean technologies in an attempt to create more environmentally friendly and energy-efficient transport.

30. Sincere efforts to move people and commodities around in an environmentally sustainable fashion are not, however, only about transport. The way societies and economies are organized and funded impacts significantly on how much can be achieved in environmental conservation by transport measures alone. Steps taken by individuals and families to minimize unnecessary vehicle travel (e.g., by buying local produce and shopping locally) and to learn about and become conscious of the environmental toll of mechanized transport are the building blocks of a more sustainable environment. The profitability of environmentally friendly transport modes, the improvement of their infrastructure maintenance capacity, and the increased efficiency of intermodal logistic service centres need to be promoted to a greater extent.

31. In the long term, achieving environmentally sustainable transport will involve changing the global car culture, according to which permanent access to a self-owned, self-driven private car is a social aspiration and a mark of social status. Campaigning for a counterculture is in its infancy. In the short term, without a cultural shift, steps are needed to lower dependency on private cars on journeys for which there is an alternative. Enhanced provision of public transport (including safer, cleaner, more reliable and convenient service) is an obvious way forward. This way, commuters might be persuaded to switch from single-occupancy vehicles for regular, predictable, high-volume trunk route trips that are ideally suited to public mass transit. Incentives and penalties for unnecessary car use might include car-free days and (automated) vehicle tolling for entry into high-traffic urban zones. Without waiting to perfect the accounting, transport users and providers need to be made to pay towards the long-term financial, social and environmental costs of journeys that damage the public infrastructure, pollute the air and undermine economic productivity by creating congestion that delays deliveries and interrupts work. Corporate air travellers need to make more use of teleconferencing, videoconferencing and virtual meetings.

Box 1
Actions taken by youth: North America

The Sierra Youth Coalition is a national initiative that inspires, informs, trains, and supports Canadian students working towards social equity, ecological integrity and economic prosperity. This is achieved through addressing institutional operations, improving curricula and mobilizing the support of campus community members. The Coalition works alongside communities and regional organizations in the spirit of anti-oppression. The Coalition legislates that no new approvals be given to development until regional plans are democratically created by the communities involved to contribute to the nature of their economic growth and also determines how ecological and socio-economic impacts will be dealt with. The Coalition urges that Canada reassess its national energy policy, and calls into question Canada's energy-exporting obligations under the North American Free Trade Agreement. The Coalition promotes the ideal that environmental justice, the right to a healthy and productive environment, should be enshrined in the Canadian Charter of Rights and Freedoms.

32. While the role of individuals, especially children and youth, in achieving sustainable transport is crucial, the implementation of regional development objectives is also important. Agenda 21 contained specific recommendations for sustainable transportation that have received limited attention. Policies need to be structured so as to improve the quality of life, increase the preservation of health, reduction of regional disparities, and the protection of the built-in and natural environments. There is a need for the improvement and extension of transport systems connecting to neighbouring countries through the creation of conditions for the efficient operation and maintenance of the systems by regulated competition. The elaboration of a main network of structures, improvement in economic competitiveness and regional accessibility at various levels will assist in the development of infrastructure for urban and suburban community transport.

IV. Waste

33. Waste generation and disposal is generally viewed as a key indicator of an unsustainable operating society, and contemporary lifestyles support enormous waste production. Waste solutions encompassing a "cradle-to-cradle" approach (from the source of production beyond the typical "after-life" management) need to be considered as part of an extended producer liability. Finished products and goods need to be designed in a way that they can be easily demanufactured and dismantled for the recovery and recycling of materials, resulting in the reduction of reliance on non-renewable resources. These concepts are not easy to achieve, however, and require a radical paradigm shift in society on the consumer level (demanding waste-wise products) as well as on the industrial level (increasing cleaner production technologies). The achievement of sustainable waste management can be realized through a process of gradual improvement in production efficiency and the

consumer's awareness of waste. Efforts are needed to reduce both the waste stream and the maximum waste at source (by preventing initial generation).

34. Recognition needs to be given to a broad hierarchy of preferred options that look at the waste stream in a cradle-to-grave approach, including:

- **Waste avoidance**: the reduction of waste at source. Through a deliberate policy of minimizing the creation of waste within an industrial process, many "waste-exchange" opportunities (whereby one company's waste becomes another's raw material) can significantly reduce costs and increase the profitability of companies
- **Reuse**: the utilization of a waste product without further transformation
- **Recycling**: the manufacturing of a product that is made from waste materials. This can only be done by a business that is technically equipped to change the properties of a former waste material into a new product. There is a distinction between closed-loop and open-loop recycling. Closed-loop recycling is a process within the same company that generated the waste, whereby the waste materials from one process is "internally recycled" to be used for another process step or to make another product. Open-loop recycling means that the waste material leaves the location where it was generated and is sent elsewhere for recycling
- **Resource recovery**: the retrieving of recyclable materials out of the waste stream or the collection of recyclable materials before they enter the waste stream — for the purpose of reuse or recycling
- **Treatment**: the processes of changing the physical and/or chemical properties of a waste product (e.g., by compaction, incineration, neutralization of acids and bases and detoxification of poisons)
- **Disposal**: the final and least desirable step in the hierarchy, involving landfilling of wastes in a controlled manner.

Box 2

Case study: Samoa adopting the Fukuoka "semi-aerobic landfill" method

In Tafaigata, Upolu Samoa, the Japan International Cooperation Agency, in partnership with the South Pacific Regional Environmental Programme, and the Government of Samoa initiated a project where a semi-aerobic landfill was established as a waste disposal method that enhances and accelerates the decomposition of waste. Key activities included:

- Pushing and compacting old waste to form five compartments to store incoming waste
- Laying of concrete and plastic pipes through the compartments to collect generated leachate
- Establishing of vertical pipes and empty drums to allow the release of generated gases
- Establishing a pond to collect generated leachate
- Periodic covering of new wastes with top soil
- Establishing new access roads within the area.

In 2003, the Tafaigata site was given a new look with the Fukuoka landfill that was environmentally friendly and had significance for the general population of Upolu. This initiative is the first of its kind to be carried out in the region and has been a great success in that:

- Risk of contamination of groundwater was reduced
- Flies and rodent issues were significantly reduced
- Waste was properly disposed of, providing adequate space to accommodate for incoming waste
- Air pollution was drastically reduced, creating a safer environment for landfill workers and residents from nearby villages.

35. A significant obstacle faced in waste management is the limited involvement of stakeholders in addressing the aforementioned issues. Waste management problems are varied, complex, infrastructural, social, economic, organizational, managerial, regulatory and legal, thus they require the input and involvement of a diverse set of stakeholders. This seldom occurs as the industry is marked by a severe lack of training and capacity-building, along with a lack of support and resources to encourage the implementation of various initiatives.

36. In addition, urbanization poses an increasingly significant obstacle for sustainable waste management. With an influx of people moving to city centres in lieu of finding local employment, increased stress is placed on service delivery (particularly in developing nations). Informal settlements appear on the periphery of urban centres, providing meagre shelter for millions of people, with little — if any — water or sanitation facilities. With no formal sewage or water systems, disease is easily spread. The socio-economic difficulties faced in these situations exacerbate the problem — as unemployment levels soar and service delivery fails — an increasing number of people are disenfranchised, resulting in increased crime and the vandalizing of what little infrastructure exists.

37. Another constraint to sustainable waste management is the lack of incentives to support waste reduction, while the efficiency and coverage of waste collection is low, predominantly in Africa. Waste sites lack facilities to sort through waste, such as organic waste, plastics, and so forth, resulting in random sorting and recovery by scavengers, usually abandoned children. Living under abysmal conditions, they face serious health and security threats.

38. Disposal in waste dumps is generally done without consideration and the co-disposal of hazardous and non-hazardous waste without segregation is common practice. This improper disposal of waste raises issues of hygiene and continuously aggravates sanitation levels. In addition, there is an ever-widening gap between policy and legislation and implementation — waste generation is on the increase and the issue of electronic waste (e-waste) is further frustrating the situation.

39. There is a growing need for the integration of waste management systems as there has generally been slow progress in improving such systems, both in terms of capacity, technical ability and financial direction. While most countries have policies on hazardous waste, the lack of management fails to ensure compliance.

This is also the case with multilateral environmental agreements — most countries have ratified relevant international instruments and are at different stages of national action plans, but there is little implementation owing to financial constraints and the lack of protocol.

40. Issues exist regarding the illegal trafficking of waste, in particular within Africa and the Russian Federation. Although now controlled through the Basel Convention and other related conventions being ratified, there is a need to strengthen border controls and income revenue authorities. There are increasing concerns about imports or used consumer goods that contain hazardous materials. An additional problem that Africa faces is the large amount of electronic waste imported from developed countries, presented as aid to the technical advancement of the continent.

41. While a significant variety of challenges are faced, there is a growing need to deal with these in a sustainable manner. Waste reduction needs to occur, which involves changing patterns of consumption, and efforts are required to increase income-generating activities within this field. Organic waste initiatives need to be broadly accepted and the use of biodegradable materials investigated further. Policy needs to support the recycling industry and associated initiatives. Those policies needs to be child- and youth-friendly, considering that young people constitute more than half of world's population. In addition, waste management programmes may present potential income-generating activities, providing opportunities for employment.[10]

42. In spite of these challenges, a number of opportunities present themselves. Policy, planning, legislation and enforcement of waste reduction need to occur at high levels, and involve the wide participation of stakeholders. Cleaner production should take the fore and appropriate technology should be developed. There is need for capacity-building, training and public awareness with regards to waste issues, which should form part of improved and integrated waste management services. Likewise, those programmes will provide citizens with the opportunity to make informed choices when producing waste. There is a need for improved finance and cost recovery, data collection and monitoring and the exchange of best practices and technology for waste collection, segregation, organic waste and controlled landfill operations. Non-governmental organizations (NGOs) can play an important role in effectively projecting community problems and highlighting the basic requirements for urban services and can assist in integrating waste scavengers into waste-management associations under the supervision of the urban local body and the relevant residents' associations.

43. Consideration needs to be given to the fact that most initiatives taken at both the governmental and community levels do not seem to address the most fundamental component of waste issues — cultural and behavioural norms. Infrastructure building is meaningless if it is not accompanied by a simultaneous shift in mentality. As long as people continue to see littering and waste disposal as a socially acceptable norm, no amount of intervention on the part of private or public actors is likely to be effective. Catalysing behavioural change in individuals and communities is difficult as it is a long-term process, requiring a significant

[10] See World Programme of Action for Youth to the Year 2000 and Beyond (General Assembly resolution 50/81, annex), para. 69.

investment of time, resources and energy. It requires viewing issues from the complex lens of human behaviour.

44. While this may present itself as a challenge, one possible route to achieving this is to capitalize on the strengths of pre-existing institutions and organizations. For example, youth, NGOs, community-based organizations, governmental institutions, civil society and interest groups need to engage with the human dimension of waste management, with one-on-one community interaction, capacity-building, grassroots-level empowerment, and ultimately, the promotion of behavioural change within societies. Private actors have the capacity to build infrastructure, to incentivize cost-effective processes, and mobilize sources of funding or capital. Government entities have the capacity (potentially) to implement large-scale, long-term initiatives for the public good, and have (ideally) the resources, the influence and, most fundamentally, the mandate to effect large-scale change.

45. To accomplish this, there is a need to develop an effective educational strategy, both formal and non-formal, that will reach children and entire communities. The process must begin by instilling in children and youth a need for taking care of their environments through proper waste management. It is, however, insufficient to simply provide information alone; an effective waste management plan is essential to ensure the implementation of practices. People must believe that information is true and important. This educational process may require extensive community interaction, but if ignored, efforts to change society's attitude towards waste management will be, literally, wasted. An additional key component to effective waste management is the recognition that individual efforts do make a difference, thus there is need to engage with individuals at a community level to perpetuate waste management campaigns and initiatives. Community leaders, at the local, provincial/state and national levels need to be involved in providing the motivation and resource access to sustainable waste management practices.

46. Neglecting the social aspect of waste management may reduce the effectiveness of governmental efforts to perpetuate sustainable management systems. There is an identified need for both skills development and education in this regard, particularly for youth who could act as major catalysts for change.

V. Chemicals

47. Chemicals play a part in almost all human activities and make major contributions to national economies. However, when not properly managed, they can put human health, ecosystems, and national economies at risk. Health and environmental impacts from the mismanagement of chemicals include increased levels of sickness and higher health-care costs, reduced worker productivity, damage to fisheries and watersheds, reduced crop outputs and many others. Misuse of chemicals also affects progress towards sustainable human development, with the poorest members of the global community — in particular women and children — most vulnerable to their negative effects. The urban and the rural poor routinely face unacceptably high risks of exposure to chemicals because of their occupations, living conditions and lack of knowledge about the proper handling of chemicals. At the same time, the ecosystems that provide the essential resources for the survival of the rural poor are threatened by chemical pollution and environmental degradation.

The need for effective life cycle management of chemicals is underscored by both the substantial contribution that chemicals make to social and economic development and the significant threats to humans and the environment that arise from their improper use and management.

48. A number of multilateral environmental agreements have been established to protect people and the environment from the adverse effects caused by the use or misuse of toxic and hazardous chemicals. The agreements tackle sound management of issues related to the use of a specific chemical, or a class of chemicals with similar characteristics, or provide comprehensive holistic approaches to chemicals governance as a whole. The best known multilateral environmental agreements related to chemical management are:

- Montreal Protocol on Substances that Deplete the Ozone Layer (1987) to the Vienna Convention for the Protection of the Ozone Layer, 1985
- Stockholm Convention on Persistent Organic Pollutants, 2001
- Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 1998
- Basel Convention on the Control of the Transboundary Movements of Hazardous Wastes and their Disposal, 1989
- The Strategic Approach to International Chemicals Management adopted in February 2007 at the International Conference on Chemicals.

49. While currently Africa is neither a major consumer nor producer of chemicals in global terms, the level of risk faced by poor countries is disproportionately higher than those with sufficient resources to effectively manage and monitor chemical use. With economic growth, Africa and other developing regions are likely to grow as producers and consumers of chemical products, increasing the importance of this issue. In particular, owing to inadequate human capacity and the lack of technology required for effective monitoring and evaluation, they will face growing challenges in the management and monitoring of chemicals.

50. The increased use of chemicals, particularly in the agricultural sector, may lead to the increased contamination of water sources, with adverse effects for the health of both humans and ecosystems. The increased exposure to agricultural and industrial chemicals and waste exacerbates the impacts of traditional environmental health risks in many developing countries. Contaminated sites and obsolete stocks present serious problems for Africa that require immediate actions. Estimates suggest that across Africa at least 50,000 tons of obsolete pesticides have accumulated. Continued trade in hazardous waste is likely to exacerbate this problem and toxic chemicals that enter the environment place a serious threat to biodiversity and ecosystems, causing disease and undermining essential functions.

51. As economies grow and gross domestic product per capita increases, the consumption of chemicals for domestic use and use in the agricultural and industrial sectors is likely to grow. With the increased use of chemicals, there is likely to be greater exposure in the workplace and home. In the agricultural sector, this will put women, youth and children at increased risk. In many cases, in both subsistence and commercial farming, producers and workers have insufficient knowledge about the health risks posed by chemicals and therefore do not adopt personal protective

measures. As a result, the increased use of chemicals will place new demands on the already fragile health sector.

52. Increased use of chemicals will contribute to increased environmental degradation and pollution. Developments in the agricultural sector may lead to the increased use of agricultural chemicals, contaminating water sources and threatening the viability of ecosystems. These developments will place both human and environmental health and well-being at risk. The contamination of water sources may lead to a decrease in the environmental goods and services that freshwater systems supply, as well as reduce the ability of nations to meet the Millennium Development Goal targets on the provision of safe water.[11]

53. Governments need to establish legal and institutional frameworks that ensure effective management of chemicals and embrace core principles as outlined in Agenda 21, including the precautionary approach, producer liability principles, the "polluter pays" principle, and comprehensive right-to-know laws that build on the wide range of multilateral environmental agreements which directly address specific chemical issues.

54. In developing a framework for chemicals management, an approach that focuses on sound management throughout their life cycle is essential. Specifically, governmental actions should relate to:

- **Risk reduction**: the prevention of and preparedness for accidents and natural disasters
- **Information and knowledge**: improving the accessibility of information on hazardous chemicals
- **Governance**: the integration of the strategic approach to international chemicals management objectives into national development planning
- **Capacity-building and technical assistance**: the promotion of life cycle approaches to chemicals management
- **Illegal international traffic**: a symposium on illegal international traffic in chemicals. The strategic approach to international chemicals management should be established at the national, regional and international levels as a coordinating structure for harmonizing legal instruments and organizations responsible for chemicals management.[11]

55. Efforts to ensure the sound management of chemicals within a context of sustainable development have important gender dimensions. In daily life, men, women, and children are exposed to different kinds of chemicals in varying concentrations. Levels of exposure to toxic chemicals — and resulting impacts on human health — are determined by social as well as biological factors. Therefore, it is critical to raise awareness about the linkages between chemical exposure, human health, environmental threats, and gender differences in risks and impacts. Integration of gender considerations throughout all stages of a country's process to strengthen its national chemical management regime will ensure that women's, as well as men's, concerns and experiences are taken into account in the design, implementation, monitoring and evaluation of chemical management policies and

[11] United Nations Environment Programme, *Africa Environmental Outlook 2* (Nairobi, 2006).

programmes, so that they can benefit equally and gender inequality is not perpetuated.

56. The United States Department of State Chemical Security Engagement Program is an example of outstanding contributions to the science, technology, education and communication of chemical health and safety. The programme is implemented internationally, with the core mission of engaging scientists in collaborative activities that improve chemical safety and security practices, reduce chemical threats, and strengthen international scientific cooperation through promoting beneficial research and development, working closely with an international network of governmental partners, national professional chemical societies, academics and chemical industry organizations.

57. In 2009, the Chemical Security Engagement Program sponsored a series of capacity-building workshops focused on chemical safety and security best practices in South-East Asia, the Middle East and North Africa. The training workshops were designed to help to institutionalize best practices at chemical laboratories in universities and industrial facilities, with the ultimate goal of strengthening international cooperation on science and chemical security. In addition, the programme has cooperated with universities to develop and improve chemical safety, security, and ethics curricula and has provided security training for chemical industry representatives. The programme plans to work with partner nations to create nationwide networks of chemical safety and security officers at universities possessing a chemistry department, through a recently developed train-the-trainer course, assisting in creating sustainable best practices in chemical security and safety.

58. To achieve sustainable practices for chemicals, legislative frameworks need to be strengthened, institutional capacities need to be advanced and support needs to be given for awareness-creation and advocacy. The application of environmentally sound technology needs to be promoted and there needs to be improved coordination between stakeholders at the local, national and binational levels, including in donor-funded initiatives at a national level. The need for increased education and awareness cannot be over emphasized, particularly regarding issues in rural communities, and increased coordination between the governmental agencies involved in terms of training and financial resources for the implementation and verification of such projects is essential in achieving the principles of sustainable development

Box 3
Youth initiatives regarding chemicals

In the European region, the World Health Organization has initiated the Children's Environment and Health Action Plan for Europe, a component of which is the election of young ambassadors for the purpose of promoting strong youth involvement. A 2004 report entitled "Children's health and environment case studies summary book" contains a database of successful initiatives (see http://www.euro.who.int/eehc/youth/20070807_1).

The Health and Environment Alliance, a platform of European NGOs, is also engaged in extensive work on chemicals and has initiated the Chemicals Health Monitor Project (see http://www.chemicalshealthmonitor.org/spip.php?article49).

VI. Sustainable consumption and production

59. WWF has estimated that the current consumption and production patterns in the United Kingdom, if replicated across the globe, would require the equivalent resources of three Earths, while the replication of American lifestyles would require five. Projections such as these indicate the scale of the challenge, given the aspirations of most developing countries to match the material living standards of the West. The obvious conclusion is that consumption habits, and the current plethora of products, services and associated production processes designed to feed this appetite are significantly out of step with the natural resources needed for material production and the ecological "sinks" available for waste disposal.

60. The main obstacle in promoting sustainable consumption and production has been that economic priorities overrule social and environmental carrying capacities. There is a need to change primary and secondary production and consumption patterns through institutionalizing the notion of a sustainable culture, despite the severe lack of support demonstrated for such processes. Currently, sustainable consumption trends are less developed than sustainable production trends, thus posing challenges for future endeavours.

61. Changing our ingrained patterns of consumption and production to be more sustainable requires fundamental alterations to our behaviour as individuals and organizations. It will require us to challenge and revolutionize the prevailing business models that externalize social and environmental costs and pass on the debt of negative impacts to future generations.

62. There are three fundamental challenges to current consumption and production systems: energy, resource depletion and ecosystem degradation. First, energy is becoming increasingly problematic, both in terms of security of supply and absolute levels of availability. The dispute between the Russian Federation and Ukraine in 2005 and 2006 over the transport of gas supplies demonstrated that up to 20 per cent of Europe's supplies could be affected by a political crisis.

63. Cutting back resource depletion, especially of non-renewable resources, is the second challenge to current modes of consumption and production. The intensive use of resources by the manufacturing industry in the United Kingdom alone wastes between £2 billion and £3 billion a year, or roughly 7 per cent of its total profit, through resource inefficiency. Resource depletion does not just mean carbon-based resources such as fossil fuels. Land degradation and the availability of land are also a cause for concern, especially in densely populated areas. Environmental degradation, the third challenge, is closely linked to the depletion of these non-renewable resources. At the global level, one critical example is climate change linked with the use of fossil fuels.

64. Meeting human needs and improving well-being at the lowest possible ecological cost is especially relevant in Asia and the Pacific, where there has been a concurrence of rapidly expanding economies, poverty levels and consumption

pressures, as well as a natural resource base that is more limited than any other in per capita terms. Rapid industrialization and urbanization in many developing countries leave a mark, with unresolved challenges on the use of resources and unsustainable patterns of consumption.

65. Despite the rapid economic growth achieved in the region, two thirds of the world's poor are based in Asia and the Pacific. Poverty-reduction goals, especially for the youngest and for other marginalized populations, are a main priority. Overpopulation and the widening income gap present the challenge of instilling in people's consciousness the merits of attaining and maintaining a sustainable lifestyle.

66. Despite the region's high poverty level, consumption exceeds the available bio-productive area per capita. The region has experienced high intensity energy use resulting in various pollution concerns. The gross inequities in current consumption of resources, both within and among nations, need to be rebalanced if the global partnership required to solve the global environmental problems is to be established. In addition, a concern that entails environmental and legal issues is the trading of secondary materials in the Asia-Pacific region. While importing second-hand materials is an alternative to using virgin materials for production, it is also a means of transferring the responsibility of final disposal to lower-income countries that may not have such capacity.

Box 4
Youth initiatives: Germany

In 2007, 1,400 youth from the International Movement of Catholic Agricultural and Rural Youth groups all over Germany gathered in Heudorf, to discuss food sovereignty and promote the concept of "ecological — fair — regional". Youth were invited to organize "Spätzle parties" to cook with villagers, using local, fair and organic ingredients while discussing the concept of food sovereignty. The food supply was predominantly regional, and products that could not be obtained regionally were purchased from Fair Trade. Water conservation was promoted and bicycles were available as a sustainable transportation means. Aims of the meeting were to identify global injustices in access to food and to work towards sustainable solutions.

67. A significant issue in the promotion of sustainable consumption and production has been poor education and a general lack of awareness. Governments the world over, most particularly in Africa, have been marked with a lack of legislation, enforcement and weak recognition of sustainable consumption and production in most policies, leading to weak institutional capacity for monitoring and a lack of decentralized power to local authorities. This has been exacerbated by a lack of human and technical capacity, including a lack of product development, tools in government and information on emerging green technologies.

68. To promote patterns of sustainable consumption and production, economic instruments, including financial instability, underpricing of natural resources and the lack of financial incentives, need to be addressed. Systemic challenges, including a lack of monitoring, training, research and development, reliable data on pollution

and resource use and consumer traditions, need to be further investigated and improved institutional settings and collaborative engagement on these issues need to be promoted. There is a need to invest in people, in particular youth, who are dedicated and willing to commit themselves to environmental governance.

69. Such investment can manifest itself in the building of both a market (and consumer appetite) for sustainable products, and industries that can support the creation of such products. This could aid in diversifying developing economies into potentially lucrative markets; a possibility currently being explored by Singapore's educational institutions, which are providing three-year full-time vocational diplomas in areas such as "clean energy" and "clean building and sustainability".

70. The essential challenge of sustainable consumption and production is how to delink economic development from environmental degradation, to operate within the limits of the planet's ecosystems. Meeting this challenge will require technological innovation, rethinking current business models, and political determination. Stronger political will and commitment are needed; the principles of the Marrakech Process need to be promoted further and the means of implementation for sustainable practices — particularly regarding tools, instruments and education — need to be more closely examined.

71. Considering that children and youth constitute a major group of consumers, changing lifestyles is a prerequisite for achieving sustainability. Child- and youth-based policy approaches to sustainable consumption and production can be seen as appropriate in promoting behavioural changes. Education for sustainable development, both formal and non-formal, should be one of the main pillars of youth empowered in environmental protection as should active and meaningful participatory decision-making processes. The negative effects of consumer societies should be reduced to a minimum. A significant determinant in lifestyle choice is the media, which perpetuates ideas of social acceptability. The negative influence of media and advertisement, especially on children and youth, should be controlled.

VII. Cross-cutting issues

72. Contemporary lifestyles have been heavily influenced by unsustainable behaviours that have been endorsed by most of the world's population. Youth make a strong call for the advancement of policies and legislation towards a just and sustainable world. Poverty eradication is essential for sustainable societies, where unsustainable patterns of production and consumption make an exception, not the rule. Furthermore, in a youthful and globalizing world, meaningful participation of not only children and youth, but also other marginalized groups, is essential. Formal and non-formal education for sustainable development should be used as a means of changing unsustainable patterns of behaviours. Long-term strategic approaches to education for sustainable development supported by State and civil society actors is one of the most influential components of achieving social and environmental justice. Gender and youth mainstreaming in policies would provide a common space for the empowerment of a marginalized group. The lack of institutional frameworks for sustainable development in developing countries should be overcome through the active role of civil society that will provide necessary information on society's needs. Regional initiatives should be strengthened through increased funding and cooperation with Governments at the regional level.